ZOOLOGY.—*Ostracoda from bromeliads in Jamaica and Florida.* Willis L. Tressler,[1] U. S. Navy Hydrographic Office.

The presence of a distinct fauna existing in the water entrapped in the leaf cups of bromeliads has been known for many years. Müller (1880) first reported upon this unique fauna from observations made in southern Brazil. An elaborate study of the bromeliad leaf-cup fauna was later made by Picado (1913), and since then reports have been made on the fauna of isolated regions. The present author (Tressler, 1941) summarized the findings of previous writers and reported on two ostracods which were found in leaf cups of bromeliads from Puerto Rico. Of these, one was a species of the little-known genus *Metacypris*, which was described as a new species (*Metacypris maracaoensis*); the other, *Candonopsis kingsleyii*, while known from several areas, was reported for the first time from bromeliads. Other ostracods previously reported from bromeliads include *Metacypris bromeliarum* (Müller, 1881) and two species imperfectly described by Picado (1913) from Costa Rica. The present paper adds two more species of Ostracoda to the bromeliad fauna and reports on new locations for two species already described from this habitat; *Candonopsis anisitsi* described from Paraguay by Daday (1905), previously has not been known from bromeliads, while a new species of Metacypris, *M. laesslei* is described for the first time. New locations are given for *Metacypris bromeliarum* and *M. maracaoensis*.

The present report is based upon an extensive collection made from bromeliad leaf cups by Dr. Albert M. Laessle of the Department of Biology, University of Florida, during the summer of 1952. Careful samplings were made of the outer and inner leaf cups of the same plant and from different plants in a number of widely separated areas on the island of Jamaica and from three areas in southern Florida. Nearly 100 samples were found to contain ostracods. In many instances a chemical analysis was made of the entrapped water.

The slides of the dissected specimens have been deposited in the U. S. National Museum as type specimens.

DISTRIBUTION AND ECOLOGY

Collections on the island of Jamaica were made from coastal areas of little or no elevation and from five regions located in the main central mountain chain extending east and west along the axis of the island. Here, elevations of 2,000 feet to 4,500 feet are found. Coastal areas include, from east to west, Ecclestown (800 feet) and Portland Parish (less than 1,000 feet), at the southern tip of the island; Union Hill (500 feet) in the north central portion; Hermitage Dam (1,500 feet) just north of Kingston; Lucca (slight elevation) and Negril (slight elevation) at the extreme western tip of the island. The mountainous areas, from east to west include Hardware Gap (4,500 feet), other areas in the Blue Mountains (elevations from 3,200 to 4,000 feet); Juan de Bolas (2,500 feet); Christiana (3,000 feet); and Mocho (2,000 feet).

The distribution of ostracod species identified appears to be irregular and conforms to no pattern of altitude or nature of the soil. Ecclestown, Union Hill, Christiana, Mocho, Lucca, and Negril are in limestone regions, while the others, namely, Portland Parish, the Blue Mountains, Hermitage Dam, and Juan de Bolas are in noncalcareous areas. The single new species described, *Metacypris laesslei*, appears to be restricted to elevations of 2,000 feet and over, being found only at Mocho, Christiana, Hardware Gap, and in St. Andrews Parish at Silver Hill Gap in the Blue Mountains.

A detailed report on the analysis of water samples taken from leaf cup reservoirs will be given in a final report on these collections by Dr. Laessle. It is sufficient for the purpose of the present taxonomic report to state that the ostracods were collected from water samples displaying a wide range of environmental conditions. Dissolved oxygen readings ranged from practically zero to 8 p.p.m.; carbon dioxide varied from 5 p.p.m. to 40 p.p.m., while pH readings ranged from pH 4.0 to 7.0 and averaged pH 5.0. Most

[1] The opinions expressed in this report are the author's own and do not reflect those of the Hydrographic Office or the U. S. Navy.

species of ostracods are very tolerant of wide fluctuations in environmental factors and will exist under conditions of oxygen depletion, pollution, and other unfavorable environmental conditions after other forms have perished. Some species are known to creep along the under surface of the surface film, apparently to secure oxygen. It is not surprising therefore that such a wide range of environmental factors was found throughout the collection of water samples and that ostracods were almost universally present in the collections.

Suborder Podocopa

Family Cypridae: Subfamily Cyprinae

Genus **Candonopsis** Vavra, 1891

Thin shelled forms, laterally compressed. Anterior antennae slender; posterior antennae, with penultimate segment subdivided, poorly developed natatory setae. Terminal segment of mandibular palp greatly produced. Maxillipeds with vibratory plate bearing three, thick, plumose setae; palp in male transformed into a prehensile organ for copulation. Dorsal margin of furca without setae. This genus contains only six species, all but one of which have been reported only from the Southern Hemisphere.

Candonopsis anisitsi Daday

Fig. 6

Candonopsis anisitsi Daday, Zool. **44:** 256, pl. 16, figs. 16–19, 20–26. 1905.

Specific characters.—Female: From the side elongated, height equal to about half the length; highest about three-fourths of the length from the anterior end. Dorsal margin gently rounded and sloping anteriorly; ventral margin indented. Anterior extremity somewhat less broadly rounded than posterior. From above, narrowly compressed. Terminal setae of third thoracic leg of equal length. Furea sixteen times longer than narrowest width; terminal and dorsal setae absent. Length 0.97–1.08 mm, height 0.48–0.53 mm. Color of preserved specimen, light.

Male: Similar to female in shape and structure of appendages. Height of shell somewhat greater in relation to length than female. Length 1.00–1.20 mm.

Remarks.—This species may easily be taken for *C. kingsleyi* on superficial examination but may be distinguished by the equal length of the terminal setae of the third thoracic leg.

Occurrence.—Males and females were found in all but four of the eleven widely separated areas which were sampled on the island of Jamaica. These areas were as follows: Portland Parish at an altitude of less than 1,000 feet, largely noncalcareous region on July 18 to July 24, 1952; the Wagwater River, just above Hermitage Dam, St. Andrews, at an elevation of 1,500 feet, noncalcareous region on July 31, 1952; Juan de Bolas, elevation 2,500 feet, noncalcareous region on August 1 to 7, 1952; near Christiana in Manchester Parish, elevations 3,000 feet, limestone region, on August 9 to 11 and August 27 to 29, 1952, and September 3, 1952; near Lucca, in the northwest portion of the island, in Westmoorland Parish, at a slight elevation, calcareous region, on September 1, 1952, near Moeho in the west central portion of the island, limestone region, elevation 2,000 feet, on August 15 and 18, 1952; and at the base of the John Crow Mountains near Eccelstown in the northwest corner of the island at 800 feet elevation, a calcareous region, on September 8, 1952. The species is evidently widely distributed over most of the island. It was not found at the higher elevations in the Blue Mountains nor in the north central portion.

Distribution.—The species was previously known only from Paraguay, where they were collected from pools formed by inundations of rivers.

Family Cytheridae

Genus **Metacypris** Brady and Robertson, 1870

Shells very broad and short; seen from the dorsal view, width about three-fourths the length. First antennae with five or six segments; second antennae 4-segmented; exopodite jointed. Mandibles with obscurely segmented palp. Maxilla with three masticatory processes and a short palp; branchial plate without aberrant or orally directed setae. Furea of female with three setae.

Metacypris bromeliarum (F. Müller)

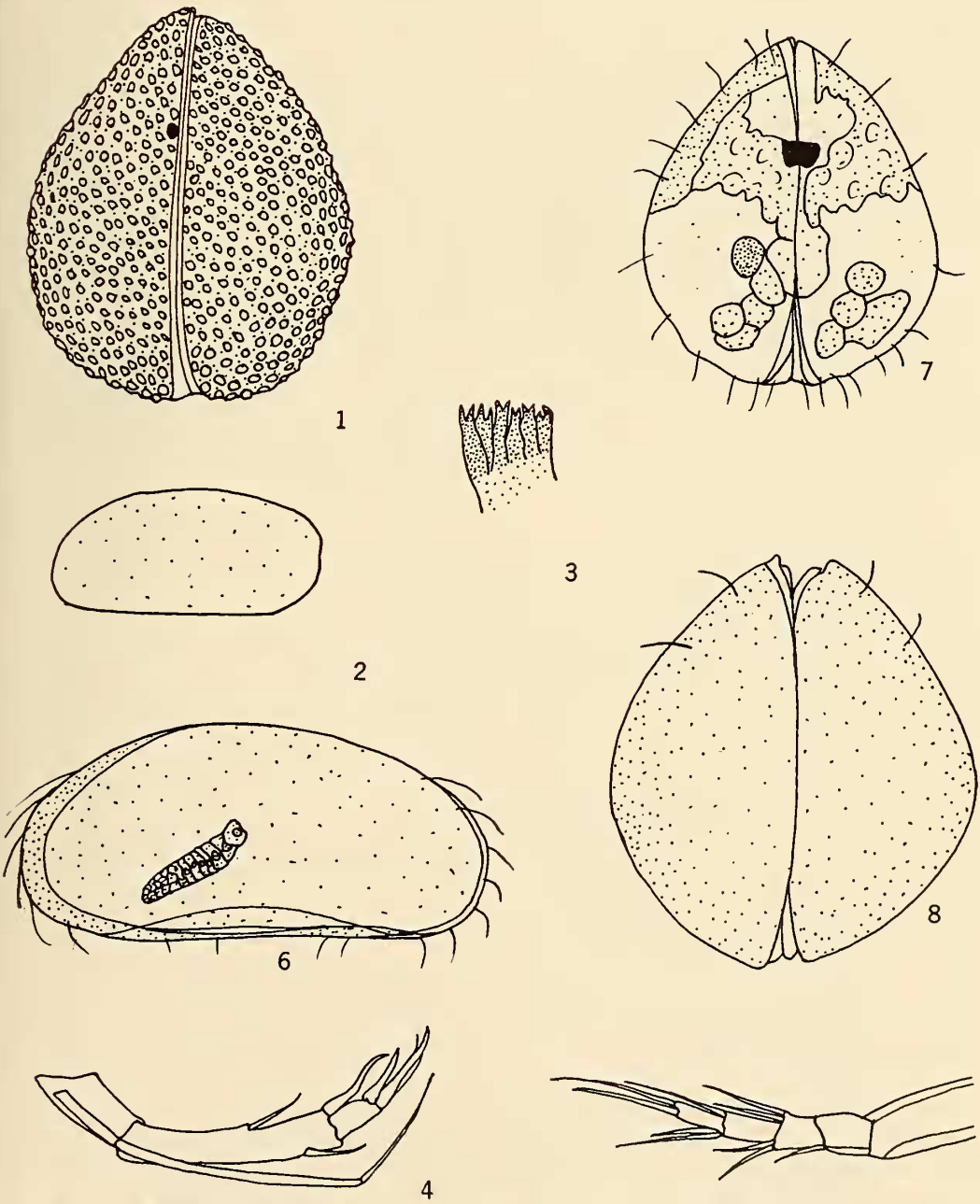
Fig. 8

Elpidium bromeliarum F. Müller, Arch. Mus. Nac. Rio de Janeiro **4:** 27. 1881.
Metacypris bromeliarum G. W. Müller, Das Tierreich **31,** Ostracoda: 316. 1912.

Specific characters.—Female: Seen from the side, ovoid, height five-eighths length, highest in middle; anterior extremity considerably less broadly rounded than posterior; dorsal margin arched, sloping steeply to anterior end; ventral

margin almost straight. Seen from above, very tumid, width four-fifths length; anterior end slightly more pointed than posterior. Surface of valves smooth with no pits and few hairs. Color brown. First antenna with five segments; dorsal border of first segment terminates in a thickly haired wart; spine on second segment reaches to middle of fourth segment. Second antenna with exopodite reaching to tips of terminal claws. Mandibular teeth, seven, not split. Length 0.84 mm, height 0.52 mm, width 0.74 mm.

Male: Unknown.



Figs. 1–5.—*Metacypris laesslei*, n. sp.: 1, Dorsal view, female; 2, outline of left valve, female; 3, mandibular teeth, female; 4, second antenna, female; 5, first antenna, female. Fig. 6.—*Candonopsis anisitsi* Daday. Fig. 7.—*Metaeypris maracaoensis* Tressler. Fig. 8.—*Metacypris bromeliarum* (F. Müller).

Occurrence.—Females were widely distributed over the island being found in all but two of the eleven areas sampled. These locations were as follows: Portland Parish at an elevation of less than 1,000 feet, a largely noncalcareous region on July 18 to 24, 1952; Wagwater River, just above Hermitage Dam, St. Andrews, elevation 1,500 feet, noncalcareous region on August 1 to 7, 1952; near Christiana in Manchester Parish, elevation 3,000 feet, limestone region on August 9 to 11, 1952, and August 27 to 29, 1952; near Lucca in the northwest portion of the island in Westmoorland Parish, at a slight elevation, calcareous region, on September 1, 1952; near Nigril in the extreme western portion of the island at a slight elevation, calcareous region on September 2, 1952; and at the base of the John Crow Mountains near Ecclestown in the northeast corner of the island, elevation 800 feet, calcareous region on September 8, 1952.

Distribution.—This species has previously been reported only from leaf cups of bromeliads in southern Brazil.

Metacypris maracaoensis Tressler

Fig. 7

Metacypris maracaoensis Tressler, Journ. Washington Acad. Sci. **31** (6): 268. 1941.

Specific characters.—Female: Seen from the side, oval in shape with greatest height about one-half the length and highest in the middle. Dorsal margin arched; ventral margin straight. Posterior extremity more broadly rounded than anterior. From above, very broadly rounded posterior extremity and pointed anterior end. Large eyes, fused. Surface of valves smooth with a few scattered hairs. Color gray with a much darker area in the anterior half of the valve. A mass of polygonal areas in vicinity of the eyes. First antenna with five segments, the spine on the second segment reaching to middle of the fourth segment. Second antenna with exopodite reaching to tips of terminal claws. Mandible with eight teeth which are split. Length 0.72 mm, height 0.37 mm, width 0.65 mm.

Male: Unknown.

Remarks.—This species is similar to *M. cordata* but is larger, the valves are without pits, and the mandibular teeth are different, numbering only four or five in *M. cordata.*

Occurrence.—Numerous females were collected from bromeliad leaf cups near Immokalee, Collier County, Fla., in July 1953.

Distribution.—This species is known only from a similar habitat in the Maracao National Forest, Puerto Rico, where it was collected at an elevation of between 2,800 and 3,000 feet in January and December.

Metacypris laesslei, n. sp.

Figs. 1–5

Specific characters.—Female: Seen from the side, oval in outline, height equal to about five-eighths length, highest in middle. Dorsal margin arched, ventral margin straight. Anterior extremity less broadly rounded than posterior. From above, width equal to six-sevenths length, anterior end somewhat pointed, posterior end broadly rounded. Surface of valves covered with small pits and a few hairs. Color brown with darker brown spots. First antenna with five segments; spine on second segment reaches to terminal fourth of fourth segment. Second antenna with exopodite barely reaching to tips of terminal claws. Mandibular teeth split and seven in number. Length 0.78 mm, height 0.49 mm, width 0.66 mm.

Male: Unknown.

Remarks.—This species is similar in size and shape to *M. maracaoensis* but differs in the presence of pits on the valves and in the number of mandibular teeth.

Occurrence.—Numerous females were found in three locations on the island of Jamaica, namely, in the Blue Mountains in St. Andrews Parish at an elevation of 3,200 to 4,000 feet, noncalcareous region, on July 3 to 9, 1952; near Mocho, west-central portion of the island, in a limestone region at an elevation of 2,000 feet on August 15 to 18, 1952; and near Christiana, Manchester Parish, elevation 3,000 feet, limestone region, on August 27 to 29, 1952. Female holotype, U. S. N. M. no. 99387. Type locality, Blue Mountains, St. Andrews Parish, Jamaica.

LITERATURE CITED

Daday, E. von. *Untersuchungen über die Süsswasser - Mikrofauna Paraguays.* Zoologica (Stuttgart) **44:** 1–374. 1905.

Müller, F. *Wassertiere in Baumwipfeln.* Kosmos **6:** 386–388. 1880.

———. *Descripsão do* Elpidium bromeliarum. Arch. Mus. Nac. Rio de Janeiro **4:** 27–34. 1881.

Picado, M. C. *Les bromeliaces epiphytes considerees comme milieu biologique.* Bull. Sc. France Belgique (7) **47:** 215–360. 1913.

Tressler, W. L. *Ostracoda from Puerto Rican bromeliads.* Journ. Washington Acad. Sci. 31 (6): 264–269. 1941.